
High Strength Structural Bolting Seminar

Advance Your Knowledge

High strength bolted connections are a fundamental element in the construction of modern steel structures, systems, and assemblies. A working knowledge of bolt design, fabrication methods, and correct installation techniques is essential to the proper design of structural steel connections, the specification of structural bolts, and the on-site installation and inspection of constructed connections for both new and in-service structures.

Our practical one-day course and “hands-on” workshop will allow you to significantly advance your understanding of the theory and application of structural bolting and bolted connections and apply that knowledge to a variety of situations in the building, transportation, waterway, and power transmission markets. You will be able to directly apply this knowledge in the development of clearer, more concise specifications and design details, in the review of fabricator shop drawing submittals and details and in the verification of proper construction during jobsite inspections.

Who Should Attend

This course will benefit both new and experienced design professionals seeking an increased understanding and awareness of bolted connections for structural steel systems for buildings, bridges, wind farms, and transmission systems. The material presented in this class will be oriented towards structural engineers, civil engineers, special inspectors, architects, engineering technicians and steel detailers.

You Will Learn

- Receipt and documentation procedures: Container labeling, storage conditions, and documentation for structural bolts.
- Bolt conditions: Effects of rust, corrosion and changed conditions on the proper tensioning of structural bolts. The necessity for proper bolt lubrication and its effect on the torque/tension relationship.
- Bolt tension identification procedures: “turn-of-nut”, direct tension indicators, torque measurements, Lejeune® devices.
- Capacity Testing: physical testing, rotational capacity testing, changed conditions retesting.
- Installation procedures: Participants will review “snug tight”, “pre-tension”, and “slip critical” connections, learn the types of permissible holes applicable to bolted connections, required conditions for faying surfaces for various types of connections, and the permissible application of beveled washers and shims under various conditions.
- Post-installation Inspection procedures: Course participants will learn correct techniques for post-installation inspection of bolted connections including sampling methodology, and visual and mechanical inspection to verify required tensions.
- Importance of proper pre-tensioning of anchorages in order to achieve correct anchorage resistance for towers and light masts.

- Review of bearing vs. slip critical connections and differences in structural bolts applicable to each.
- Understand the importance of correct preparation of faying surfaces.
- Workshop Session: Participants will receive “hands-on” experience in achieving specified bolt tensions with bolts of varying conditions using a Skidmore –Wilhelm bolt tension calibrator.

Meet Your Course Instructor

Gerald R. Schroeder, P.E. is nationally recognized as an expert in bolted connections for large scale structural systems and provides consulting services through Fish & Associates to public and private sector clients covering pre-installation testing and inspection, handling and installation, and post-installation inspection of bolted connections and anchor rods. Mr. Schroeder served in a variety of bridge design and engineering positions during his 37 year tenure with the Federal Highway Administration. He is a member of ASTM Fastener Committee F-16, which writes and maintains manufacturing specifications for structural bolts. He is also a member of the Research Council for Structural Connections, which develops installation specifications for structural fasteners. Jerry consults on a variety of project types ranging from bridges to commercial, industrial and institutional facilities, to tunnels, ancillary sign structures, and wind farms.



Fish & Associates, Inc.

Partners in Structural Solutions

- Installation
- Inspection

11:30 - Bolting Theory & Behavior

- Friction
- Joints
- Paint
- Snug Tight
- Final Tensioning
- Inspection

12:00 - Lunch

1:00 - Installation Methods

- Turn of Nut
- Direct Tension Indicators (DTI)
- Tension Control Bolts (TC)
- Calibrated Wrench
- Installation and Inspection Procedures

1:45 - Re-use of Fasteners

- A325 & A490 Bolts
- Re-test requirements

2:00 – Break

2:15 - Holes & Washer Use

- Slotted & Oversized Holes
- Required Washers

3:15 - Post Installation Inspection

- Inspection Methods

3:45 - Course Evaluation/Feedback

4:00 - Discussion and Wrap-up

8:30 - Introduction and Welcome

- Jerry Schroeder, P.E.
- Course Announcements
- “Self-assessment” of bolting knowledge
- Course handouts

9:00 - Background

- Specifications & Manufacturing
- Fastener Assembly Demo
- Effects of lubrication and bolt condition on torque/tension

9:30 - Purchase, Storage, Handling

- Receipt / Inspection of Fasteners
- Storage of Fasteners
- Problems and Solutions to Common Field Issues

10:00 - Break

10:15 - Testing

- Pre-installation testing
- Physical Testing
- Rotational Capacity Test Demonstration
- Changed Conditions Retesting

11:00 - Anchor Rods

- Problems

General Information

Presentation Environment: This course is conducted in an informal, relaxed and interactive environment designed to offer practical experience, reinforce concepts, and promote questions.

Continuing Education: A certificate of attendance for six (6) professional development hours will be received upon completion of this course.

Limited Enrollment: To ensure an appropriate learning environment and optimum group size for the interactive workshop segment, enrollment will be limited to 30 participants per session.

Location: This “High Strength Structural Bolting” seminar will be held on **Month Day, 2011** from 8:30 AM to 4:30 PM at the **Location to be identified**.

Fee Includes: Course manual and handouts, lunch, break refreshments and certificate of attendance. Course materials are distributed only to enrolled participants.

Enrollment and Course Fees

Fish & Associates is currently presenting this program of instruction to state DOT's, Federal Agencies, and to private consultants and constructors both nationally and regionally. We have adapted this course to respond to the needs of professional engineers and designers also and are making this training opportunity available to design and construction professionals nationwide. The program of instruction will cover the same topics and content as our DOT training sessions, without the need to participate in a certifying examination, which can be incorporated optionally

To enroll in this course and confirm your participation, please contact us directly via phone or e-mail. Payment can be made by check to “Fish & Associates, Inc.”.

by Internet: www.fishassoc.com

by Phone: (608) 831-3238



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